

APPENDIX I

U.S. RESIDUE LIMITS FOR VETERINARY DRUGS, FOOD ADDITIVES AND UNAVOIDABLE CONTAMINANTS IN MEAT, POULTRY, AND EGG PRODUCTS

This appendix has been generated for the convenience of the reader, and if any discrepancies arise between this appendix and the Code of Federal Regulations (CFR), the values from the latter source should be used. Appendix I provides chemical residue limits (tolerances) in tissue by production class and by compound for veterinary drugs, food additives, and unavoidable contaminants in meat, poultry, and egg products. The Food Safety and Inspection Service (FSIS) in its regulatory programs apply chemical residue limits, which are set by the Food and Drug Administration (FDA). The official source of the tolerances is Title 21 of the CFR. Those for veterinary drugs are found in Title 21, Part 556, those for food additives are found in Title 21, Part 172, Section 172.140, and those for unavoidable contaminants are found in, Title 21 Part 109, Section 109.30. All chemical residue limits are provided in units of parts per million (ppm) unless otherwise noted.

Table AI
Residue Limits for Veterinary Drugs, and Unavoidable Contaminants
National Residue Program

Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat ¹ by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
2-Acetyl-amino-5-nitrothiazole	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1 ²	21 CFR 556.20
Aklomide	Cattle Goats Hogs Horses Poultry Sheep Eggs	3	4.5		4.5			21 CFR 556.30
Albendazole ³	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.05 0.05		0.2 0.25			21 CFR 556.34
Altrenogest	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.001		0.004			21 CFR 556.36
Amoxicillin	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.01	21 CFR 556.38
Ampicillin	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.01 0.01	21 CFR 556.40
Amprolium	Cattle Goats Hogs Horses Poultry Sheep Eggs	2.0	0.5 0.5 ⁴		0.5 1 ⁴	0.5 1 ⁵		21 CFR 556.50
							4 ⁶ , 8 ⁷	

Table AI - Continued
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
National Residue Program

Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat ¹ by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Apramycin	Cattle Goats Hogs Horses Poultry Sheep Eggs					0.1		21 CFR 556.52
Arsenic	Cattle Goats Hogs Horses Poultry ⁵ Sheep Eggs	0.5	0.5 0.5	0.5 2	2	2		21 CFR 556.60
Bacitracin	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.5 0.5 0.5 ⁸ 0.5 ⁶	21 CFR 556.70
Bambermycin	Cattle ⁹ Goats Hogs ⁹ Horses Poultry ⁹ Sheep Eggs							
Buquinolate	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.4	0.1		0.4	0.4	0.5 ⁶ ,.2 ⁷	21 CFR 556.90
Carbadox	Cattle Goats Hogs Horses Poultry Sheep Eggs				0.03			21 CFR 556.100
Ceftiofur ¹⁰	Cattle Goats Hogs Horses Poultry Sheep Eggs		2 ³¹ 2		2 3	8 0.25		21 CFR 556.113

Table AI - Continued
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
National Residue Program

Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat ¹ by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Cephapirin	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1	21 CFR 556.115
Chlorhexidine	Cattle Goats Hogs Horses Poultry Sheep Eggs						0	21 CFR 556.120
Chlortetracycline ¹¹	Cattle	12	2		6	12	0.4	21 CFR 556.150
	Goats							
	Hogs	12	2		6	12		
	Horses							
	Poultry ⁵	12	2		6	12		
Sheep	12	2		6	12			
Eggs								
Clopidol ⁵	Cattle		0.2		1.5	3	0.2	21 CFR 556.160
	Goats		0.2		1.5	3		
	Hogs							
	Horses							
	Poultry		5		15	15		
Sheep			0.2	1.5	3			
Eggs								
Clorsulon	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.1			1		21 CFR 556.163
Cloxacillin	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.01	21 CFR 556.165
Colistimethate	Cattle Goats Hogs Horses Poultry ⁹ Sheep Eggs							21 CFR 556.167

Table AI - Continued
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
National Residue Program

Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat ¹ by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Danofloxacin	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.2		0.2			21 CFR 556.169
Decoquinatate	Cattle Goats Hogs Horses Poultry ¹² Sheep Eggs	2 2 2	1 1 1	2 2 2	2 2 2	2 2 2		21 CFR 556.170
Dichlorvos	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1	21 CFR 556.180
Diclazuril	Cattle Goats Hogs Horses Poultry ⁵ Sheep Eggs	1 ¹⁶	0.5		3			21 CFR 556.175
Dihydro-streptomycin	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.5 0.5	0.5 0.5	0.5 0.5	0.5 0.5	2.0 2.0		21 CFR 556.200
3,5-Dinitro-benzamide	Cattle Goats Hogs Horses Poultry Sheep Eggs						0	21 CFR 556.220
Doramectin ^{27,32,33}	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.03		0.1 0.16			21 CFR 556.225

Table AI - Continued
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
National Residue Program

Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat ¹ by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Enrofloxacin	Cattle				0.1 ¹³			21 CFR 556.228
	Goats							
	Hogs							
	Horses		0.3					
	Poultry							
	Sheep Eggs							
Eprinomectin	Cattle		0.1		4.8			21 CFR 556.227
	Goats							
	Hogs							
	Horses							
	Poultry							
	Sheep Eggs							
Erythromycin	Cattle						0.1	21 CFR 556.230
	Goats						0.1	
	Hogs						0.125	
	Horses						0.025	
	Poultry							
	Sheep Eggs							
Estradiol benzoate and related esters ¹⁴	Cattle	480 ^{14,28}	120 ^{14,28}		240 ^{14,28}	360 ^{14,28}		21 CFR 556.240
	Goats							
	Hogs							
	Horses							
	Poultry							
	Sheep Eggs	600 ¹⁴	120 ¹⁴		600 ¹⁴	600 ¹⁴		
Ethopabate	Cattle							21 CFR 556.260
	Goats							
	Hogs							
	Horses		0.5		1.5	1.5		
	Poultry							
	Sheep Eggs							
Ethoxyquin	Cattle	5	0.5					21 CFR 172.140
	Goats	5	0.5					
	Hogs	5	0.5					
	Horses	5	0.5					
	Poultry	3	0.5		3			
	Sheep Eggs	5	0.5				0.5	
Famphur	Cattle	0.1	0.1	0.1				21 CFR 556.273
	Goats							
	Hogs							
	Horses							
	Poultry							
	Sheep Eggs							

Table AI - Continued
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
National Residue Program

Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat ¹ by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Fenbendazole	Cattle		0.4		0.8			21 CFR 556.275
	Goats		0.4		0.8			
	Hogs		2		6			
	Horses							
	Poultry			2		6		
	Sheep							
Eggs								
Fenprostalene	Cattle							21 CFR 556.277
	Goats							
	Hogs							
	Horses							
	Poultry							
	Sheep							
Eggs								
Florfenicol	Cattle		0.3		3.7			21 CFR 556.283
	Goats							
	Hogs		0.2		2.5			
	Horses							
	Poultry							
	Sheep							
Eggs								
Flunixin meglumine	Cattle ²⁹		0.025		0.125			21 CFR 556.286
	Goats							
	Hogs							
	Horses							
	Poultry							
	Sheep							
Eggs								
Furazolidone	Cattle						0	21 CFR 556.290
	Goats							
	Hogs							
	Horses							
	Poultry							
	Sheep							
Eggs								
Gentamicin sulfate	Cattle	0.4	0.1		0.3	0.4		21 CFR 556.300
	Goats							
	Hogs							
	Horses							
	Poultry							
	Sheep							
Eggs	0.1							
Halofuginone hydrobromide	Cattle				0.16,0.13			21 CFR 556.308
	Goats							
	Hogs							
	Horses							
	Poultry							
	Sheep							
Eggs								

Table AI - Continued
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
National Residue Program

Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat ¹ by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Haloxon	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1	21 CFR 556.310
Hygromycin B	Cattle Goats Hogs Horses Poultry Sheep Eggs						0 0 0	21 CFR 556.330
Ivermectin	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.01 0.02		0.001, 0.015 ¹⁵ 0.02 0.03			21 CFR 556.344
Lasalocid	Cattle Goats Hogs Horses Poultry Sheep Eggs Rabbit	0.2 ^{12,16} 0.4 ^{2,16}			0.7 0.4 0.4 ⁵ 1.0 0.7			21 CFR 556.347
Levamisole hydrochloride	Cattle ³⁰ Goats Hogs Horses Poultry Sheep Eggs						0.1 0.1 0.1	21 CFR 556.350
Lincomycin	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.1		0.6			21 CFR 556.360

Table AI - Continued
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
National Residue Program

Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat ¹ by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Maduramicin ammonium	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.38						21 CFR 556.375
Melengestrol acetate	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.025						21 CFR 556.380
Metoserpate hydrochloride	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.02 ⁵	21 CFR 556.410
Monensin	Cattle Goats Hogs Horses Poultry ^{.17} Sheep Eggs						0.05 0.05	21 CFR 556.420
Morantel tartrate ¹⁸	Cattle Goats Hogs Horses Poultry Sheep Eggs				0.7 0.7			21 CFR 556.425
Moxidectin	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.05		0.2			21 CFR 556.426

Table AI - Continued
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
National Residue Program

Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat ¹ by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Narasin	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.48						21 CFR 556.428
Neomycin	Cattle ²⁷ Goats Hogs Horses Poultry ² Sheep Eggs	7.2 7.2 7.2 7.2 ¹⁶ 7.2	1.2 1.2 1.2 1.2		3.6 3.6 3.6 3.6	7.2 7.2 7.2 7.2		21 CFR 556.430
Nequinatate	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1 ⁵	21 CFR 556.440
Nicarbazin	Cattle Goats Hogs Horses Poultry ¹² Sheep Eggs	4 ¹⁹	4		4	4		21 CFR 556.445
Novobiocin	Cattle Goats Hogs Horses Poultry Sheep Eggs						1 1	21 CFR 556.460
Nystatin	Cattle Goats Hogs Horses Poultry Sheep Eggs	0					0 0	21 CFR 556.470
Oleandomycin	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.15 0.15 ⁶	21 CFR 556.480

Table AI - Continued
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
National Residue Program

Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat ¹ by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Ormetoprim	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1	21 CFR 556.490
Oxfendazole	Cattle ²⁰ Goats Hogs Horses Poultry Sheep Eggs				0.8			21 CFR 556.495
Oxytetracycline	Cattle	12	2		6	12		21 CFR 556.500
	Goats							
	Hogs	12	2		6	12		
	Horses							
	Poultry ⁵	12	2		6	12		
	Sheep	12	2		6	12		
	Eggs							
PBB's	Cattle Goats Hogs Horses Poultry Sheep Eggs							FDA revoked, effective January 5,1987, all action levels in meat and poultry
PCB's ²¹	Cattle	3						21 CFR 109.30
	Goats	3						
	Hogs	3						
	Horses	3						
	Poultry	3						
	Sheep	3						
	Eggs							
Penicillin	Cattle						0.05	21 CFR 556.510
	Goats						0	
	Hogs						0 ³⁴ ,.01 ²	
	Horses						0	
	Poultry						0	
	Sheep						0 ⁶	
	Eggs							

Table AI - Continued
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
National Residue Program

Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat ¹ by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Pirlimycin	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.3			0.5			21 CFR 556.515
Progesterone	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.012	0.003		0.006	0.009		21 CFR 556.540
		0.015	0.003		0.0015	0.015		
Pyrantel tartrate	Cattle Goats Hogs Horses Poultry Sheep Eggs		1		10	10		21 CFR 556.560
Ractopamine hydrochloride	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.03		0.09			21 CFR 556.570
			0.05		0.15			
Robenidine hydrochloride	Cattle Goats Hogs Horses Poultry ¹² Sheep Eggs	0.2 ¹⁶					0.1 ⁵	21 CFR 556.580
Spectinomycin	Cattle ²⁷ Goats Hogs Horses Poultry Sheep Eggs		0.25			4	0.1	21 CFR 556.600
Streptomycin	Cattle ²⁴	0.5	0.5	0.5	0.5	2	0.5	21 CFR 556.610
	Goats							
	Hogs	0.5	0.5	0.5	0.5	2	0.5	
	Horses Poultry Sheep Eggs	0.5	0.5	0.5	0.5	2	0.5	

Table AI - Continued
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
National Residue Program

Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat ¹ by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Sulfabromomethazine sodium	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1	21 CFR 556.620
Sulfachloropyrazine	Cattle Goats Hogs Horses Poultry ¹² Sheep Eggs						0	21 CFR 556.625
Sulfachlorpyridazine	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1 0.1	21 CFR 556.630
Sulfadimethoxine	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1 0.1	21 CFR 556.640
Sulfaethoxy-pyridazine	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1 0	21 CFR 556.650
Sulfamethazine	Cattle Goats Hogs Horses Poultry ⁵ Sheep Eggs						0.1 0.1 0.1	21 CFR 556.670

Table AI - Continued
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
National Residue Program

Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat ¹ by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Sulfanitran	Cattle Goats Hogs Horses Poultry ¹² Sheep Eggs						0	21 CFR 556.680
Sulfaquinoxaline	Cattle Goats Hogs Horses Poultry ⁵ Sheep Eggs						0.1 0.1	21 CFR 556.685
Sulfathiazole	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1	21 CFR 556.690
Sulfomyxin	Cattle Goats Hogs Horses Poultry ⁵ Sheep Eggs						0	21 CFR 556.700
Testosterone propionate	Cattle ²² Goats Hogs Horses Poultry Sheep Eggs	0.0026	0.00064		0.0013	0.0019		21 CFR 556.710
Tetracycline ¹¹	Cattle ²³ Goats Hogs Horses Poultry ⁵ Sheep Eggs	12 12 12 12	2 2 2 2		6 6 6 6	12 12 12 12		21 CFR 556.720
Thiabendazole	Cattle Goats Hogs Horses Poultry ²⁴ Sheep Eggs						0.1 0.1 0.1 0.1	21 CFR 556.730

Table AI - Continued
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
National Residue Program

Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat ¹ by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Tiamulin	Cattle Goats Hogs Horses Poultry Sheep Eggs				0.6 ²⁵			21 CFR 556.738
Tilmicosin	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.1 0.1 0.1		1.2 7.5		1.2	21 CFR 556.735
Trenbolone	Cattle ⁹ Goats Hogs Horses Poultry Sheep Eggs							21 CFR 556.739
Tripelennamine	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.2	21 CFR 556.741
Tylosin	Cattle Goats Hogs Horses Poultry ⁵ Sheep Eggs	0.2 0.2 0.2 0.2 ⁶	0.2 0.2 0.2		0.2 0.2 0.2	0.2 0.2 0.2		21 CFR 556.740
Virginiamycin	Cattle ⁹ Goats Hogs Horses Poultry ⁹ Sheep Eggs	0.4	0.1		0.3	0.4		21 CFR 556.750
Zeranol	Cattle ^{9,27} Goats Hogs Horses Poultry Sheep Eggs						0	21 CFR 556.760

Table AI - Continued
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
National Residue Program

Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat ¹ by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Zoalene ²⁶	Cattle Goats Hogs Horses Poultry Sheep Eggs	2 ¹²	3 ⁵		6 ¹² , 3 ²	6 ¹²		21 CFR 556.770

¹ Unless otherwise indicated meat by product includes liver and kidney

² Turkey only

³ Marker residue: albendazole 2-aminosulfone

⁴ Chicken, turkey and pheasants

⁵ Chicken and turkey

⁶ Whole egg

⁷ Egg yolk

⁸ Chicken, turkey, pheasants and quails

⁹ No tolerance required

¹⁰ Marker residue is desfuoylceftiofur

¹¹ Tolerances are for the sum of all approved tetracycline residues (i.e., tetracycline, chlortetracycline, and oxytetracycline)

¹² Chicken only

¹³ Marker desethylene ciprofloxacin

¹⁴ Tolerance in parts per trillion

¹⁵ American bison and reindeer

¹⁶ Skin with adhering fat

¹⁷ Chicken, turkey, and quail

¹⁸ N-methyl-1,3-propanediamine

¹⁹ Skin

²⁰ Marker residue is fenbendazole

²¹ Temporary

²² Heifers; no residues are permitted at concentrations above these, which represent the levels naturally present in untreated animals

²³ Calves

²⁴ Pheasants only

²⁵ Marker residue is 8-alpha-hydroxymutilin

²⁶ Tolerances are established for residues of zoalene (3,5-dinitro-o- toluamide) and its metabolite 3-amino-5-nitro-o-toluamide

²⁷ For bob veal, formula fed veal, and non-formula fed veal there is a zero tolerance

²⁸ For use in heifers, steers, and calves. Do not use in calves intended for reproduction or calves less than 30 days old. Do not use in calves to be processed for veal. For bob veal, formula fed veal, and non-formula fed veal there is a zero tolerance

²⁹ For dairy cows, bob veal, formula fed veal, and non-formula fed veal, the tolerances are zero

³⁰ Not for use in dairy animals of breeding age

Table AI - Continued
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
National Residue Program

³¹ Injection site muscle tolerance is 166 ppm

³² Do not slaughter cattle within 45 days of latest treatment in the ophthalmic and topical form

³³ Not for use in female dairy cattle 20 months of age or older

³⁴ Chicken, pheasants, quail